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(54) **DISHWASHING DEVICE CONFIGURED TO PERFORM A CLEANING CYCLE WITH A FIXED VOLUME OF WATER**

(57) A dishwashing device performing a cleaning cycle using a fixed volume of water. It comprises a first water tank filled with water prior to starting the cycle; a main housing receiving utensils and receiving water from the first water tank; a second water tank receiving used wash water from the main housing; a storage compartment with a cleaning agent that is dispensed into the main housing; a controlling device configured to activate transfer of water from the first water tank into the main housing. The controlling device further activates transfer of used wash water from the main housing into the second water tank and controls dispensing of the cleaning agent from the storage compartment.

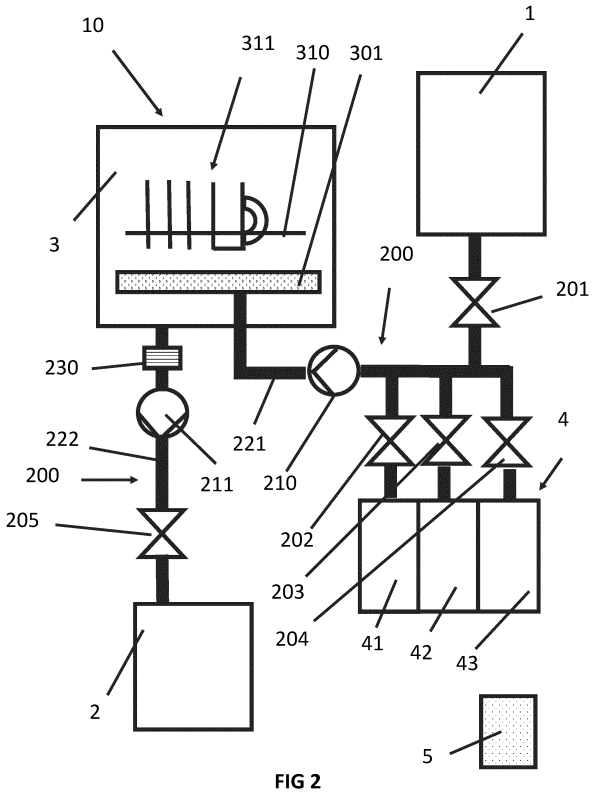

FIG 2

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Description

TECHNICAL FIELD

[0001] The invention relates to the field of dishwashing device such as dishwashers that enable a sustainable washing performance without requiring access to a tap water inlet. In particular, the invention pertains to dishwashing devices that can clean utensils using a fixed volume of water and without heating said water.

TECHNOLOGICAL BACKGROUND

[0002] Dirty dishes and more generally dirty utensils such as for example cups, mugs, dishes, plates, forks, spoons, knives are either washed by hand using a dishwashing product or inside a dishwasher.

[0003] When the cleaning operation is done by hand, users generally use more water than necessary and tend to use hot water. Beyond the burdensome task of having to do the washing up, such non optimized use of water is not very ecological or sustainable.

[0004] Furthermore, the cleaned utensils then need to be left over to dry or be dryed by hand, which is sometimes unpractical as utensils need to be left in a special rack to dry and remaining water can accumulate under that rack until the drying step is over.

[0005] Using a dishwasher is not a sustainable and ecological solution either, especially in smaller households with one or a few people, who do not generate enough dirty dishes to fill a dishwasher. Typically, the automatic cleaning cycles in dishwashers consume up to 2 kWh of electricity and the cleaning process itself takes time. Furthermore, in smaller households dirty utensils typically pile up in the dishwasher until the dishwasher is reasonably full before starting a cleaning process. This makes utensils unavailable for days before they can be used again, which is further unhygienic.

[0006] Using dishwashers adds a further constraint in that it requires a connection to a water supply (hot or cold) as well as connection of the dishwasher to a drain pipe which therefore makes the dishwasher location bound.

[0007] For the above reasons, a device and method adapted for running a cleaning cycle that has a better portability is sought.

SUMMARY OF THE INVENTION

[0008] To address the above need, the invention provides a dishwashing device configured to perform a cleaning cycle using a fixed volume of water, the dishwashing device comprising:

- a first water tank configured to be filled with the fixed volume of water prior to starting of the cleaning cycle;
- a main housing configured to receive utensils to be cleaned, the main housing being further configured to receive water from the first water tank;
- at least one second tank configured to receive used wash water from the main housing;
- a storage compartment configured to receive at least one cleaning agent, the storage compartment being configured to dispense the at least one cleaning agent into the main housing;
- a controlling device configured to activate transfer of water from the first water tank into the main housing, the controlling device being further configured to activate transfer of used wash water from the main housing into the second water tank and to control dispensing of the at least one cleaning agent from the storage compartment.

[0009] The invention thereby provides a portable machine that does not require connection to a water inlet. The dishwashing device of the invention can be easily dismounted or transported to different places, for example taken on vacation, used in areas that do not have access to tap water or electricity, as long as there is the possibility to find a fixed volume of water (typically for 1,5 L to 3 L) required to perform a cleaning cycle. The dishwashing device of the invention is particularly suited for small households and can economically and environmentally friendly clean a small number of utensils (dishes, cups, knives, forks and spoons for example).

[0010] By collecting all of the used wash water in a second water tank, the dishwashing device of the invention enables a better treatment of used wash water prior to disposing of it. The second water tank can for example be disconnected from the dishwashing device to dispose of the used wash water in a water treatment facility or to use it in another application such as in a toilet, in particular in locations where access to water is limited.

[0011] According to an embodiment, the dishwashing device may be configured to run the cleaning cycle using water from the fixed volume of water, , wherein the dishwashing device is void of heating elements for heating the water.

[0012] The dishwasher of the invention does not require heating elements and can either use water that is at the ambient temperature from the tank in which the water is stored or at the temperature one can get from a water supply line. Heating elements generally consume most of the electrical power in dishwashers during a cleaning cycle. The water that is filled into the first water tank does not need to be cooled or heated which makes the dishwashing device more flexible and easier to use.

[0013] According to an embodiment, the dishwashing device may further comprise a power supply device providing electrical energy to the controlling device.

[0014] The power supply device ensures that all the elements that require activation using electrical energy to create mechanical movements inside the dishwashing device, such as for example activation of pumps or valves receive electrical energy without requiring a connection to an electrical grid. This renders the dishwashing device

even more flexible in use. The dishwashing device can thus easily be transported and used as a dishwashing assistant even in remote areas. Typically the device requires a voltage that is lower than 50V and can be achieved using batteries or renewable sources of energy such as solar panels that can also remain functional without being connected to an electrical network.

[0015] According to an embodiment, the transfer of water from the first water tank into the main housing, the transfer of used wash water from the main housing into the second water tank and the dispensing of the at least one cleaning agent from the storage compartment may be enabled by activating one among valves and pumps controlled by the controlling device.

[0016] The valves may advantageously be electrically activatable valves. Instead of valves, the dispensing of liquids in the dishwashing device can also occur using pumps, in particular low energy consumption pumps with a high control on the amount dispensed such as peristaltic pumps.

[0017] According to an embodiment, the main housing may further comprise at least one spraying mechanism delivering water from the first water tank, the at least one spraying mechanism further delivering the at least one cleaning agent, the at least one spraying mechanism comprising at least one among: a rotatable spray arm, a traversing spray arm and a nozzle.

[0018] According to an embodiment, the dishwashing device may further comprise a water filter arranged at a fluid connection between the main housing and the second water tank.

[0019] By arranging a filter for example in a fluid line between the main housing and the second water tank, it is possible to catch most of the dirt particles that are eliminated from the main wash cycle or subsequent rinse cycles during the cleaning cycle performed by the dishwashing device. Water that is filtered can then be reinjected to perform a further cleaning operation. According to an embodiment, the dishwashing device may further comprise a circulation system, the circulation system creating a controllable pathway for water circulation between the main housing and at least a portion of the second water tank.

[0020] According to an embodiment, the circulation system may be configured to create a circulation of water from the main housing and into the second water tank via activation of a first rinse valve, wherein the circulation system further comprises a fluid connection between at least a portion of the second water tank and the main housing to allow a circulation of filtered water from the second water tank into the main housing via activation of at least one among an injection valve and a circulation pump.

[0021] According to an embodiment, the second water tank may comprise at least a first reservoir and a second reservoir, wherein the circulation system comprises a first fluid connection with the first reservoir for a water transfer between the main housing and the first reservoir via the first rinse valve, and wherein the circulation system comprises a second fluid connection with the second reservoir for a water transfer between the main housing and the second reservoir via a second rinse valve.

[0022] By separating the second water tank into two compartments, it is possible to evacuate water from the main wash cycle, typically particularly dirty even after use of the filter, so that this water is not reinjected into the main housing again but stored in the second reservoir. Water from intermediary cycles (cycles subsequent to the main wash cycle) is typically not as dirty and can be reinjected into the main housing after filtering. Such a separation into two reservoirs can save up to two thirds of water consumed during the cleaning cycle, making the dishwashing device particularly economical and more sustainable than dishwashing machines.

[0023] According to an embodiment, the dishwashing device may further comprise a base assembly, the base assembly being in fluid connection with the first water tank, the main housing, the second water tank and the storage device, the circulation system being arranged in the base assembly.

[0024] Presence of the base assembly contributes to making the dishwashing device more compact easy to transport and assemble/disassemble, by including all the pipes and possibly even valves and pumps into one frame (the base assembly) that is more compact to store.

[0025] The invention also pertains to a method for performing a cleaning cycle using a fixed volume of water, the method comprising:

- filling a first water tank with the fixed volume of water;
- selecting a program for performing the cleaning cycle;
- determining and operating using a processor a dispensing strategy for dispensing water from the first water tank into a main housing containing utensils to be cleaned and a dispensing strategy for dispensing at least one cleaning agent from a storage compartment into the main housing;
- determining and operating an evacuation of used wash water from the main housing into a second water tank.

[0026] According to an embodiment, the method may further comprise:

- determining, using the processor, a required volume of water required for performing the selected program;
- comparing the determined required volume of water to the fixed volume of water;
- outputting a request to add more water in the first water tank if the fixed volume of water is lower than the required volume of water.

[0027] According to an embodiment, the method may further comprise:

- controlling, using the processor, a circulation pump and a first rinse valve in a circulation system providing a fluid connection between the main housing and at least a portion of the second water tank, so that water from the main housing circulates through a filter in the circulation system and is redirected back into the main housing.

[0028] According to an embodiment, the method may further comprise:

- determining a quality of used wash water exiting the main housing;
- based on the determined water quality, direct the used wash water to a first reservoir of the second water tank if the determined water quality is above an acceptable threshold quality and direct the used wash water to a second reservoir of the second water tank if the determined water quality is below an acceptable threshold quality.

[0029] The "threshold quality" typically can be set based on a threshold conductance of the used wash water, a threshold turbidity of the used wash water or the presence of certain residues identified using optical means.

[0030] According to an embodiment, the method may further comprise:

- controlling, using the processor, a circulation pump, a first rinse valve and a second rinse valve in a circulation system providing a first fluid connection between the main housing and a first reservoir of the second water tank and a second fluid connection between the main housing and a second reservoir of the second water tank, so that used wash water from a main wash cycle of the cleaning cycle is directed into the second reservoir of the second water tank and used wash water from at least one intermediate rinse cycle is directed into the first reservoir of the second water tank and reinjected into the main housing during a rinse cycle scheduled after the at least one intermediate rinse cycle.

[0031] The invention further pertains to a computer program product comprising instructions for executing a method for performing a cleaning cycle using a fixed volume of water, the method comprising:

- obtaining a selected program for performing the cleaning cycle;
- determining and outputting instructions to perform a dispensing strategy for dispensing water from the first water tank into a main housing containing utensils to be cleaned and a dispensing strategy for dispensing at least one cleaning agent from a storage compartment into the main housing;
- determining and outputting instructions to perform an evacuation of used wash water from the main housing into a second water tank.

[0032] The above computer program product can also be viewed as a non-transitory computer readable storage medium having stored thereon a computer program comprising instructions for execution of the method described above.

BRIEF DESRIPTION OF THE DRAWINGS

[0033] The present disclosure will hereinafter be described in conjunction with the following drawing figures, wherein like numerals denote like elements, and:

Fig. 1 is a schematic representation of a dishwashing device according to an exemplary embodiment;
Fig. 2 is a schematic representation of a diagram showing fluid connections in a dishwashing device according to an exemplary embodiment;
Fig. 3 is a schematic representation of a diagram showing fluid connections in a dishwashing device according to another exemplary embodiment;
Fig. 4 is a schematic representation of a diagram showing fluid connections in a dishwashing device according to yet another exemplary embodiment;
Fig. 5 is a flowchart illustrating steps of an exemplary embodiment of a method to run a cleaning cycle with a fixed volume of water.

DETAILED DESCRIPTION

[0034] The invention provides a portable assistant for washing a small number of utensils without using any connection to a water inlet. The dishwashing device of the invention typically can be moved to a different location easily for example by being transported where a dishwashing operation is needed with little access to water, or the dishwashing device can be disassembled and reassembled in the new location where it is intended to be used.

[0035] Figure 1 provides one exemplary schematic representation of a dishwashing device according to the invention. This dishwashing device 10 can typically be substantially rectangular in shape and have dimensions from 50cm x 50 cm x 50cm to 50cm x 1m x50 cm.

[0036] The dishwashing device 10 typically comprises a main housing 3 with a door 8 that is hermetically sealable and openable to include at least one rack on which about 10 utensils to be washed can be placed. The main housing 3 may advantageously rest on a base arrangement 6, which can for example comprise pipes establishing a fluid connection between different elements of the dishwashing device 10.

[0037] The dishwashing device 10 also comprises a first water tank 1 which is configured to receive a fixed volume of water that will be used during a cleaning cycle performed by the dishwashing device 10. The fixed vol-

ume of water may typically be in the range of 1L to 3L, particularly preferably from 1,5L to 2,5L.

[0038] The first water tank 1 is in fluid communication with the main housing 3 to inject water during the cleaning cycle. The dishwashing device 10 further comprises a second water tank 2, which can for example be placed at a lower point of the dishwashing device 10 so that used wash water in the main housing may flow directly to the lowest point of the dishwashing device 10 after activation of a rinse mechanism. The second water tank 2 may for example be located under the base arrangement 6 and the main housing 1 may have a slanted bottom that leads to a central drainage point. From this central drainage point a fluid communication allows used wash water from the main housing 1 to be directed towards the second water tank 2.

[0039] The dishwashing device 10 further comprises a storage compartment 4 that is configured to receive at least one cleaning agent that is injected into the main housing 1. The storage compartment may advantageously comprise several cartridges 41, 42, 43, for example 3 to 6 cartridges each containing a different cleaning agent suitable for efficiently performing a cleaning cycle. One cartridge may comprise an enzyme used during the first minutes of the cleaning cycle. Another cartridge may comprise an alkali cleaning agent injected later during the main wash cycle. A third cartridge may comprise a rinse agent. Each cartridge of the storage compartment 4 is in fluid communication with the main housing to dispensing the at least one cleaning agent in a controlled fashion.

[0040] The cartridges can be replaced and/or refilled and the content of these cartridges typically can last for more than one cleaning operation. The volume of cleaning agent in each cartridge may typically be between 10 ml and 1L, preferable in the range of 30 mL to 500 mL, even more preferably in the range of 50 mL to 400 mL.

[0041] To control dispensing of water from the first water tank 1, the at least one cleaning agent from the storage compartment 4, activation of cleaning mechanisms inside the main housing 3 and channeling of used wash water from the main housing 3 to the second water tank 2, the dishwashing device 10 comprises a processor 5.

[0042] The processor 5 may further comprise a memory storage device for storing pre-programmed cleaning cycles, and wireless communication capabilities to be able to receive instructions from a remote user interface such as an application on a smartphone, tablet smart watch or from any computer, server or remote user interface. The base arrangement 6 may also comprise a user interface to allow a user to input and select a program for the cleaning cycle that he wishes to be performed.

[0043] Electrical energy to perform the cleaning cycle, activate the processor 5 can be provided by a power supply device 7, which can be a battery or an accumulator. The dishwashing device 10 does not require a connection to an electrical grid which renders it even more flexible and usable in remote locations, for example in outdoor settings, in the countryside or in situations where water and electricity is not available everywhere.

[0044] Alternatively, power supply can be provided by a cable power supply to be plugged into an electrical grid system. Both options can also be made available for increased convenience.

[0045] All of the elements described above are arranged so that they can be easily mounted and dismounted from the base arrangement 6, and the elements when mounted do not leak. This is made possible by the use of valves to control the transfer of fluid and cleaning agent from each container of the dishwashing device 10.

[0046] As can be seen on figure 2, the main housing 3 typically comprises at least one rack 310 on which utensils 311 to be cleaned are placed. The water from the first water tank 1 is dispensed in the main housing 3 using a spraying mechanism 301 similar to those typically found in dishwashers such as spraying arms, traversing arms or nozzles.

[0047] Figure 2 provides a schematic illustration of a very basic embodiment for connecting the first water tank 1, the storage compartment 4 and the second water tank 2 to the main housing 3. In this embodiment, water is used once without being recycled. Water from the first water tank 1 is dispensed by activating a valve 201 and a circulation pump 210. Similar valves 202-204 are found on each cartridge of the storage compartment 4 to dispense the cleaning agents into the main housing 3. As can be seen on figure 2, the cleaning agent and the water from the first water tank 1 premix prior to being delivered into the main housing 1 when they join in a fluid line 221. Circulation of water and cleaning agents can be facilitated by the suction mechanism of a low power pump for the circulation pump 210. The circulation pump is for that matter typically a low-voltage direct current pump (operating at a voltage below 50 V) with speed control capabilities, controlled by the processor 5.

[0048] To offer a fine control over the amounts of water and cleaning agent that are dispensed. Instead of valves 201-204 or in addition thereto, each fluid line can comprise a metering system such as for example a metering pump. One particularly advantageous type of pump allowing a fine control of the amounts of fluid dispensed are peristaltic pumps that further offer the advantage that they consume less energy and do not pollute the fluid that flows through a fluid line.

[0049] Metering pumps also called dosing pumps such as peristaltic pumps can typically allow the dosage of small quantities of fluid for example in the range of 0,01 g/s to 10 g/s, preferably in the range of 0,1 g/s to 1 g/s. The circulation pump 210 then creates a turbulent flow that mixes the water with the at least one cleaning agent so that the water that is injected into the main housing 3 is already an emulsion comprising water and the cleaning agent. Settings of the circulation pump 210, controlled by the processor 5 enable an appropriate pressure to be created in the fluid line 221 so that circulation and mixing

of fluids is possible, overcoming flow resistance. Diameters of the fluid lines is also designed so that such amounts of water and cleaning agent can be dosed efficiently.

[0050] As can be seen on figure 2, used wash water exits the main housing 3 by circulating along a second fluid line 222. Prior to entering the second water tank 2, the used wash water is filtered at a filter 230. This filter may typically have a fine grid structure with openings of the order of 0,05 mm to 2 mm preferably 0,1 mm to 1,5 mm particularly preferably 0,2 mm to 0,9 mm. The filter can be removed for cleaning purposes.

[0051] According to the basic exemplary embodiment of figure 2, the used wash water is not reinjected into the main housing 3 and only directed via the second fluid line 222 to the second water tank 2. A rinse valve 205 can be used to open a channel for the used wash water to flow into the second water tank 2. Pump 211 is optional as used wash water may simply flow under the action of gravity by flowing to the lowest point of the dishwashing device 10. However, presence of the pump 211 may help suck used wash water through the filter 230.

[0052] Fluid lines 221, 222 constitute a circulation system 200. This circulation system can further substantially contribute to water efficiency by recycling water from the second water tank 2 as seen in the exemplary embodiments provided below.

[0053] Figure 3 is a schematic illustration of an improved exemplary embodiment of the dishwashing device 10. In this example, used wash water can be reinjected into the main housing 3 after passing through the filter 230. Reinjection can occur under the suction of circulation pump 210, which can advantageously be placed after the junction of the fluids lines coming from the first water tank 1, the storage compartment 4 and the rinse valve 205 (not represented in figure 3). It is also possible to control the timing at which used wash water is reinjected into the main housing 3 by using a multi-directional rinse valve 205, that directs filtered used wash water into the second water tank 2. A valve 207 can be activated to reinject the filtered used wash water from the second water tank 2 back into the main housing 3. In this embodiment, circulation system 200 contributes significantly to saving water during the cleaning cycle.

[0054] Figure 4 is a schematic illustration of another exemplary embodiment in which a further improvement consists in arranging the second water tank 2 into a first reservoir 20 and a second reservoir 21. Typically the second reservoir 21 can be used to collect used wash water from the main wash cycle of the cleaning cycle. This used wash water, even after passing through filter 230, generally still remains dirty. It is therefore advisable not to reinject it into the main housing 3. A second rinse valve 206 can be arranged in the circulation system 200 for that purpose. Although figure 4 represents second rinse valve 206 as being arranged on the fluid line that connects rinse valve 205 to the first reservoir 20, it is to be understood that second rinse valve 206 can be directly arranged on fluid line 212. Although not represented, used wash water collected in the second reservoir 21 can be purged after completion of the cleaning cycle or during the cleaning cycle by expelling it out of the dishwashing device. It is however advantageous to recycle this water, which can for example be used in a toilet or other application in which purity of water is not a major concern.

[0055] Water from intermediate cycles, occurring after the main wash cycle, generally remains cleaner than the water collected in the second reservoir 21. It is then advantageous to reinject this filtered used wash water back into the main housing or to store it temporarily in the first reservoir 20 and decide when to reinject it by activating a valve 207, as described above in connection with figure 3.

[0056] The arrangement proposed in figure 4 can save up to two thirds of the used wash water, and still achieve very satisfactory cleaning performances. For example, when using 2,25L of water in the first water tank, 0,75L can be used during the main wash cycle. 0,75L can be used during a subsequent cycle and then reused as often as necessary to perform intermediate cycles. During a final rinse cycle, 0,75L of additional water from the first water tank 1 can be added to remove any remaining dirt and channel into the first reservoir 20 which then collects 1,5L of used wash water.

[0057] Although not represented in the figures, the dishwashing device 10 can further comprise a fan that can be activated during a drying cycle at the end of the cleaning cycle.

[0058] According to a further embodiment, not represented on the figures, a wash water quality measuring device can be placed in the circulation system 200, for example after the filter 230. This wash water quality measuring device can be a turbidity measuring sensor, a conductivity measuring sensor or an optical sensor that performs a spectroscopic analysis of the content of the wash water. Based on the results of this measuring device, it can be decided continuously or intermittently whether a volume of water needs to be saved for later use in the first reservoir 20, or directly reinjected into the main housing 3, or whether the poor quality of the water would justify directing the water into the second reservoir 21.

[0059] The invention not only concerns the dishwashing device 10 described above, but also pertains to a method for performing a cleaning cycle using a fixed volume of water.

[0060] As represented on figure 5, such a method 500 may typically first comprise a step of filling 501 the first water tank 1 with water. Then, a user may select a program for performing the cleaning cycle, for example at a user interface in the base arrangement 6. Then a processor 5 may determine and operate 502 a dispensing strategy for dispensing water from the first water tank into a main housing 3 containing utensils 311 to be cleaned and a dispensing strategy for dispensing at least

one cleaning agent from a storage compartment 4 into the main housing. Then the processor 5 may determine and operate 503 an evacuation of used wash water from the main housing 3 into the second water tank 2.

[0061] It is further possible to include a step of checking whether the fixed volume of water present in the first water tank 1 is sufficient to perform the cleaning cycle or not. It the amount that is detected (using a weighing device under the first water tank or any metering device or graduation on the first water tank 1 for determining water volume) is below an amount that is known to be required, a warning can be sent to a user to add more water.

[0062] The steps of the examples and embodiments described above can be implemented by a processor such as a processor in a computer, or a computer itself. A computer program product comprising steps of the above-described method can be used to implement the method on a computer.

[0063] It is possible to store a computer program comprising instructions to implement the method of the invention on different non-transitory computer readable storage mediums. These could for example comprise a processor or chip, FPGA (field programable gate array), an electronic circuit comprising several processors or chips, a hard drive, a flash or SD card, a USB stick, a CD-ROM or DVD-ROM or Blue-Ray disc, or a diskette.

[0064] While at least one exemplary embodiment has been presented in the foregoing detailed description, it should be appreciated that a vast number of variations exist. It should also be appreciated that the exemplary embodiment or exemplary embodiments are only examples, and are not intended to limit the scope, applicability, or configuration of the various embodiments in any way. Rather, the foregoing detailed description will provide those skilled in the art with a convenient road map for implementing an exemplary embodiment as contemplated herein. It being understood that various changes may be made in the function and arrangement of elements described in an exemplary embodiment without departing from the scope of the various embodiments as set forth in the appended claims.

Claims

1. A dishwashing device (10) configured to perform a cleaning cycle using a fixed volume of water, the dishwashing device comprising:

   - a first water tank (1) configured to be filled with the fixed volume of water prior to starting of the cleaning cycle;
   - a main housing (3) configured to receive utensils (311) to be cleaned, the main housing being further configured to receive water from the first water tank;
   - at least one second tank (2) configured to receive used wash water from the main housing;
   - a storage compartment (4) configured to receive at least one cleaning agent, the storage compartment being configured to dispense the at least one cleaning agent into the main housing;
   - a controlling device (5) configured to activate transfer of water from the first water tank into the main housing, the controlling device being further configured to activate transfer of used wash water from the main housing into the second water tank and to control dispensing of the at least one cleaning agent from the storage compartment.

2. The dishwashing device according to claim 1 configured to run the cleaning cycle using water from the fixed volume of water, wherein the dishwashing device is void of heating elements for heating the water..

3. The dishwashing device according to any one of the preceding claims, further comprising a power supply device (7) providing electrical energy to the controlling device.

4. The dishwashing device according to any one of the preceding claims, wherein the transfer of water from the first water tank into the main housing, the transfer of used wash water from the main housing into the second water tank and the dispensing of the at least one cleaning agent from the storage compartment is enabled by activating one among valves (201-205) and pumps controlled by the controlling device.

5. The dishwashing device according to any one of the preceding claims, wherein the main housing further comprises at least one spraying mechanism (301) delivering water from the first water tank, the at least one spraying mechanism further delivering the at least one cleaning agent, the at least one spraying mechanism comprising at least one among: a rotatable spray arm, a traversing spray arm and a nozzle.

6. The dishwashing device according to any one of the preceding claims, further comprising a water filter (230) arranged at a fluid connection (222) between the main housing and the second water tank.

7. The dishwashing device according to claim 6, further comprising a circulation system (200) wherein the circulation system is configured to create a circulation of water from the main housing and into the second water tank via activation of a first rinse valve (205) , wherein the circulation system further comprises a fluid connection between at least a portion of the second water tank and the main housing to allow a circulation of filtered water from the second water tank into the main housing via activation of at

least one among an injection valve (207, 208) and a circulation pump (210).

8. The dishwashing device according to claim 7, wherein the second water tank comprises at least a first reservoir (20) and a second reservoir (21), wherein the circulation system comprises a first fluid connection with the first reservoir for a water transfer between the main housing and the first reservoir via the first rinse valve, and wherein the circulation system comprises a second fluid connection with the second reservoir for a water transfer between the main housing and the second reservoir via a second rinse valve (206).

9. The dishwashing device according to any one of claims 7 or 8, further comprising a base assembly (6), the base assembly being in fluid connection with the first water tank, the main housing, the second water tank and the storage device, the circulation system being arranged in the base assembly.

10. A method (500) for performing a cleaning cycle using a fixed volume of water, the method comprising:

- filling (501) a first water tank (1) with the fixed volume of water;
- selecting a program for performing the cleaning cycle;
- determining and operating (502), using a processor (5), a dispensing strategy for dispensing water from the first water tank into a main housing (3) containing utensils (311) to be cleaned and a dispensing strategy for dispensing at least one cleaning agent from a storage compartment (4) into the main housing;
- determining and operating (503) an evacuation of used wash water from the main housing into a second water tank (2).

11. The method of claim 10 wherein the method further comprises:

- determining, using the processor, a required volume of water required for performing the selected program;
- comparing the determined required volume of water to the fixed volume of water;
- outputting a request to add more water in the first water tank if the fixed volume of water is lower than the required volume of water.

12. The method according to any one of claims 10 or 11, further comprising:

- controlling, using the processor, a circulation pump (210, 211) and a first rinse valve (205) in a circulation system (200) providing a fluid connection between the main housing and at least a portion of the second water tank, so that water from the main housing circulates through a filter (230) in the circulation system and is redirected back into the main housing.

13. The method according to any one of claims 10 to 12, further comprising:

- controlling, using the processor, a circulation pump (210, 211), a first rinse valve (205) and a second rinse valve (206) in a circulation system providing a first fluid connection between the main housing and a first reservoir (20) of the second water tank and a second fluid connection between the main housing and a second reservoir (21) of the second water tank, so that used wash water from a main wash cycle of the cleaning cycle is directed into the second reservoir of the second water tank and used wash water from at least one intermediate rinse cycle is directed into the first reservoir of the second water tank and reinjected into the main housing during a rinse cycle scheduled after the at least one intermediate rinse cycle.

14. The method according to any one of claims 10 to 13, further comprising:

- determining a quality of used wash water exiting the main housing;
- based on the determined water quality, direct the used wash water to a first reservoir of the second water tank if the determined water quality is above an acceptable threshold quality and direct the used wash water to a second reservoir of the second water tank if the determined water quality is below an acceptable threshold quality.

15. Computer program product comprising instructions for executing a method for performing a cleaning cycle using a fixed volume of water, the method comprising:

- obtaining a selected program for performing the cleaning cycle;
- determining and outputting instructions to perform a dispensing strategy for dispensing water from the first water tank into a main housing containing utensils to be cleaned and a dispensing strategy for dispensing at least one cleaning agent from a storage compartment into the main housing;
- determining and outputting instructions to perform an evacuation of used wash water from the main housing into a second water tank.

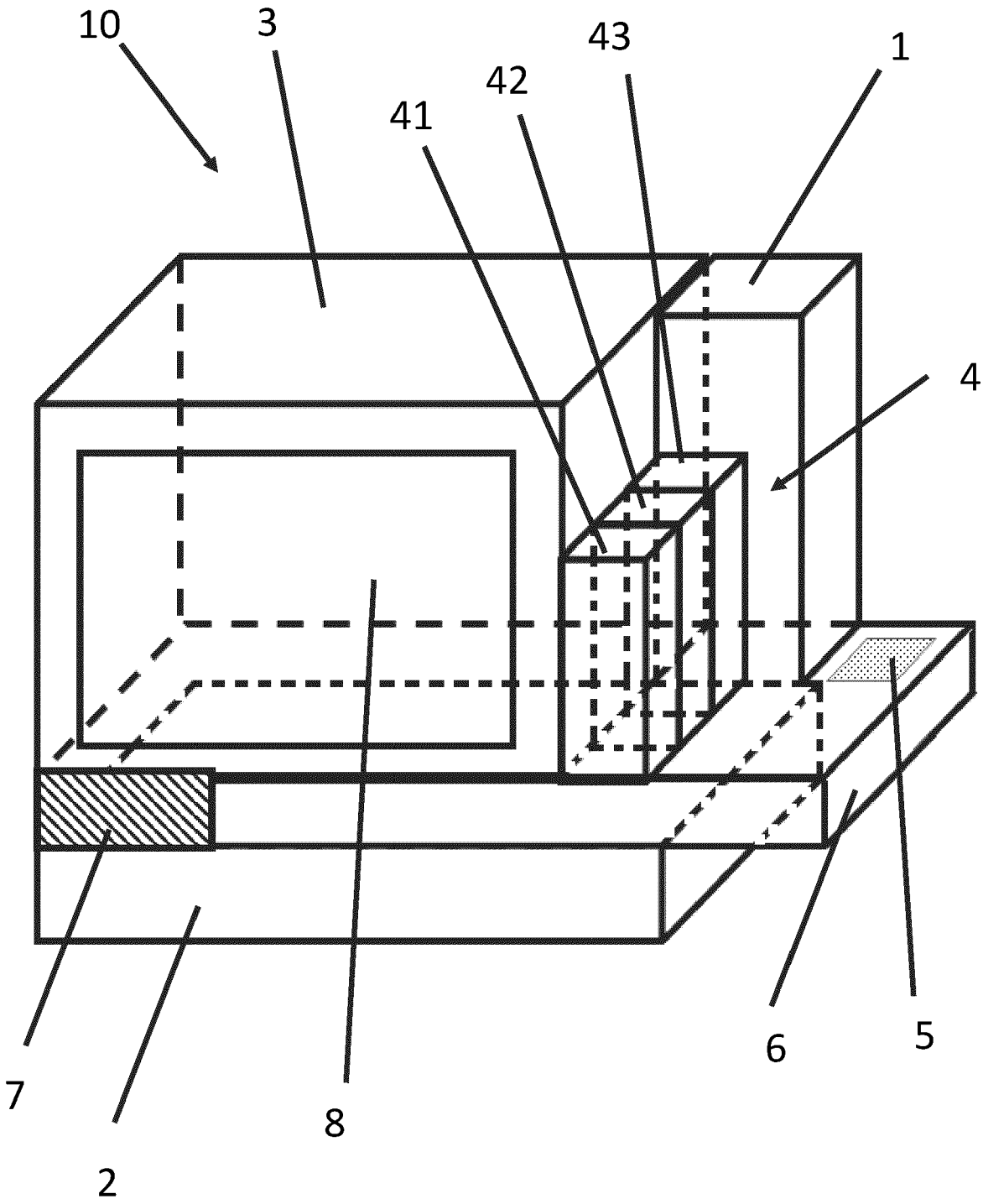


FIG 1

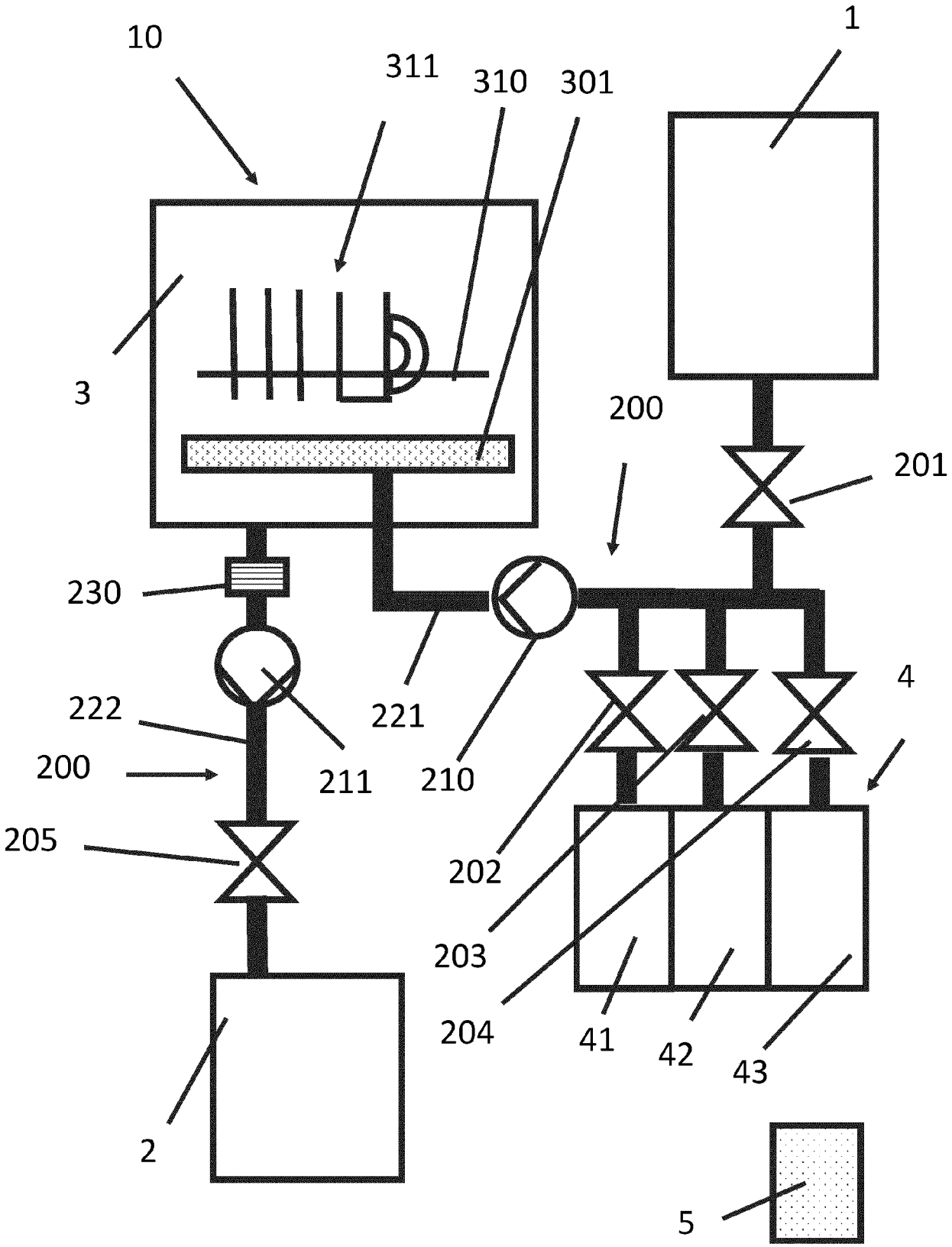
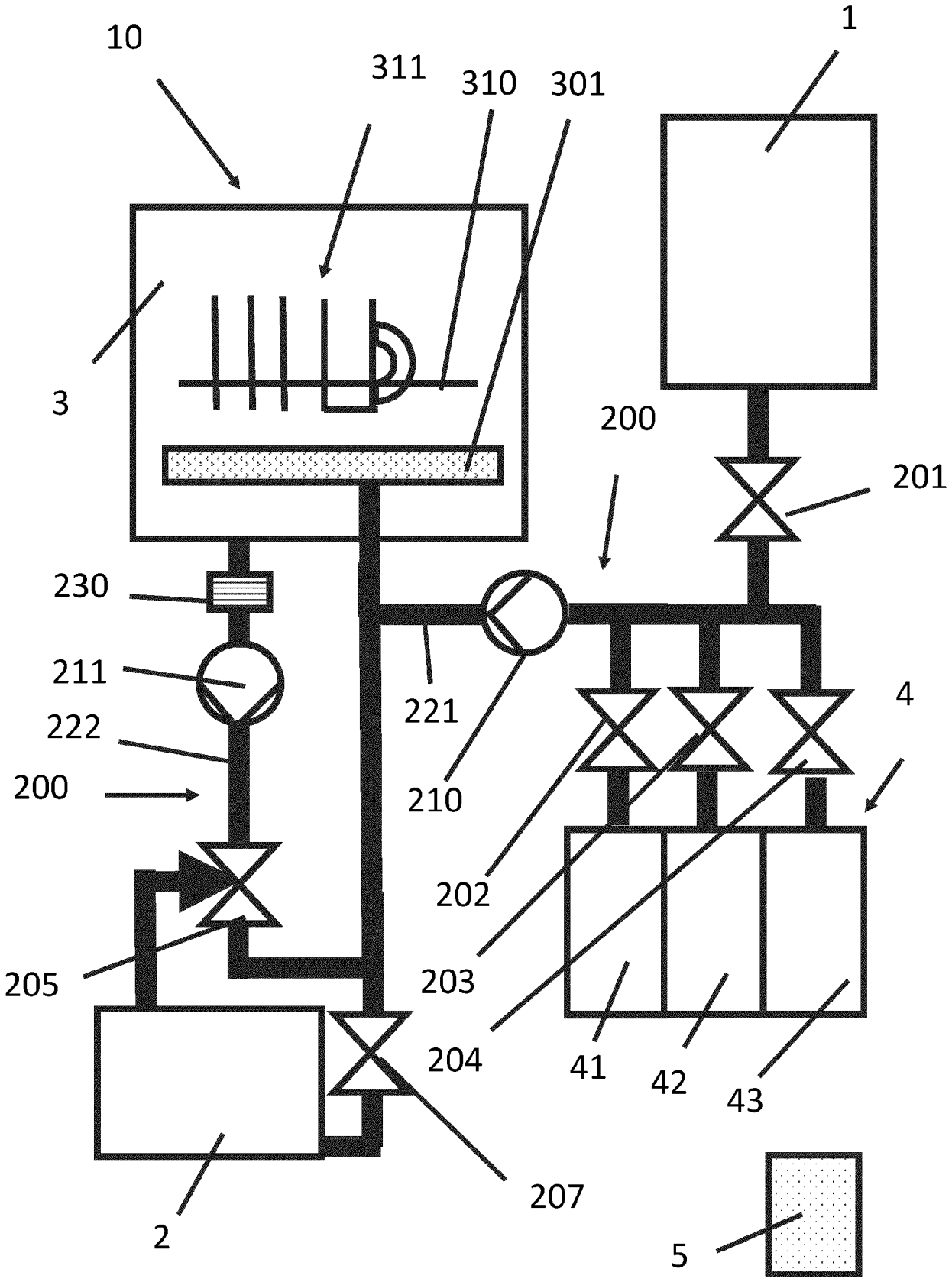

10
311
310
301
1
3
200
201
230
4
222
221
200
211
210
205
202
203
204
41
42
43
2
5

FIG 2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42
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207
2
5

FIG 3

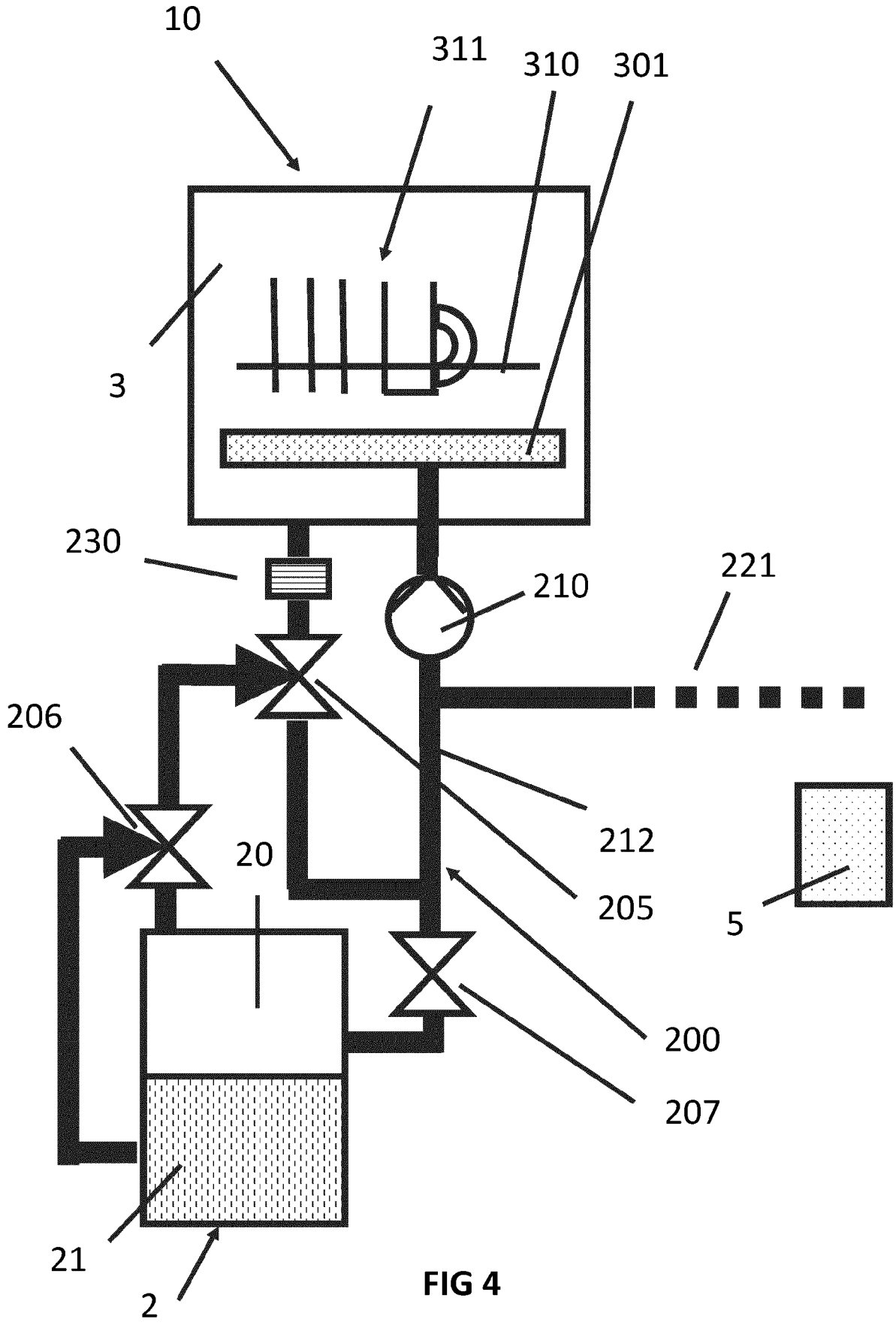

FIG 4

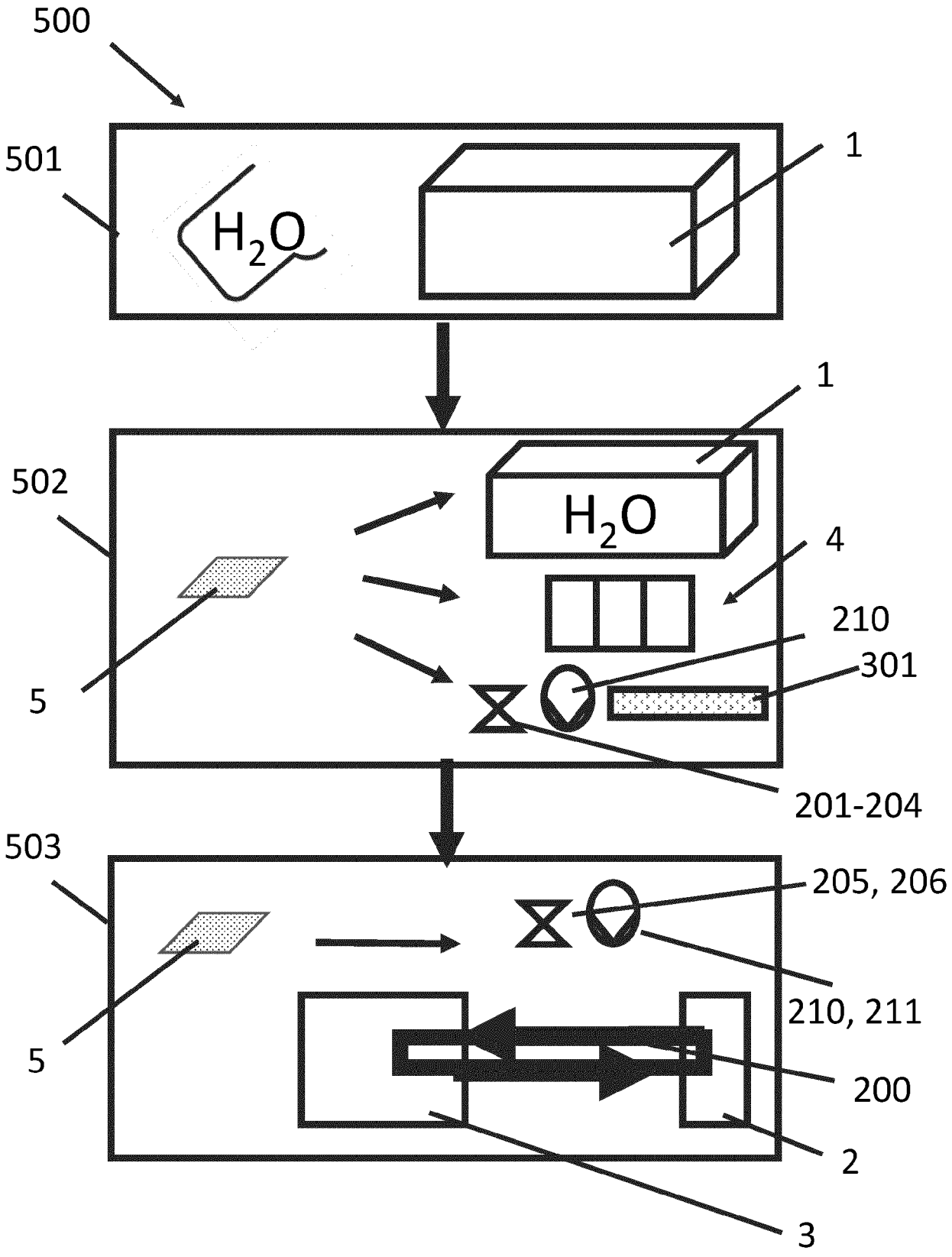
500
501
H_2O
1
1
502
H_2O
4
210
301
5
201-204
503
205, 206
210, 211
5
200
2
3

FIG 5

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EUROPEAN SEARCH REPORT

Application Number
EP 22 17 2051

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	25 October 2022	Werner, Christopher

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